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LITHOGRAPHIC ABSTRACTS, MAY 1960

PHOTOGRAPHY, TONE & COLOR CORRECTION

PHOTOTYPOGRAPHY AS AN INTEGRATED PROCESS - Part I. Carl P. Palmer. Graphic Arts Monthly 32, No. 2, February 1960, pp. 23, 24, 25, 26, 28 (5 pages). After a brief introduction explaining the background of typography in letterpress, author explores differences for other processes. A table relates operations to the individuals or groups responsible for those operations throughout the entire printing process. The operations are then divided into two phases: Planning and execution. The rest of this Part I goes through the planning stages step-by-step from the standpoint of: I Customer. II Designer. III Typographer.

PHOTOTYPOGRAPHY AS AN INTEGRATED PROCESS - Part II. Carl P. Palmer. Graphic Arts Monthly 32, No. 3, March 1960, pp. 56, 57, 58, 60 (4 pages). This part carries the work through the stages of platemaking (lithographic, photoengraving, photopolymer, gravure, screen process) and on through the printing operation.

TONE REPRODUCTION REQUIREMENTS OF THE BLACK PRINTER. J.A.C. Yule. Graphic Arts Monthly 32, No. 2, February 1960, pp. 66, 68,70,72,74 (5 pages). The tone-reproduction requirements for the black printer in four-color printing are worked out with the aid of an additivity diagram. The optimum tone reproduction for use when the density range of the original is unreproducible is discussed. 5 diagrams, 1 reference.

SYSTEMS ANALYSIS OF THE PHOTOGRAPHIC PROCESS. I. A THREE-STAGE MODEL. D. H. Kelly. Journal of the Optical Society of America 50, No. 3, March 1960, pp. 269-276 (8 pages). A nonlinear, isotropic model is proposed to account for the micro-imaging behavior of the photographic process, without violating well-known properties of its large-area tone scale. Image growth and other "adjacency" effects are predicted. Each stage of the model is described in detail, and methods of determining the output image for any given input image are discussed. A typical step-function response is calculated by way of example.

APPRAISAL OF LAND'S WORK ON TWO-PRIMARY COLOR PROJECTIONS. Deane B. Judd. Journal of the Optical Society of America 50, No. 3, March 1960, pp. 254-268 (15 pages). An analysis of the results of Land's experiments with two-primary color projections has been carried out in terms of the known phenomena of object-color perception. It is shown that no new theory is required for the prediction of Land's result that two-primary color projections can produce object-color perceptions of all hues; nor for his result that many choices of pairs of primaries yield substantially the same object-color perceptions. Land's hypothesis that when the colors of the patches of light making up a scene are restricted to a one-dimensional variation of any sort, the observer usually perceives the objects in that scene as essentially without hue, is new; several special cases of it are supported by previous work as well as Land's. This hypothesis deserves the serious attention of research workers in object-color perception.

STANDARDS OF REFLECTANCE. Wolfgang Budde. Journal of the Optical Society of America 50, No. 3, March 1960, pp. 217-220 (4 pages). The reflectances of a number of different barium sulfate substances were measured. The measurements show a correlation between the reflectance and chemical impurities as well as their grain sizes. In view of the problem of developing better working white standards, the importance of these results is discussed with respect to the magnesium oxide white standard, as well as the perfect diffuser which the CIE recently recommended for ultimate adoption as the reference standard.

THE SHARPNESS OF PHOTOGRAPHIC MATERIALS. R. E. Stapleton. The Journal of Photographic Science 8, No. 1, January/February 1960, pp. 14-18 (5 pages). The sharpness of a film must be estimated for the particular conditions of use: the limiting performance for either high or low contrast objects at high magnifications may be described satisfactorily by the resolution figures; the sharpness of larger images may be expressed conveniently in terms of the image width just showing some loss of density, but because local developer exhaustion effects occur almost universally, it is necessary to use a form of test chart similar to the type of image to be photographed.

3-COLOR PRINTING (To be continued). Ansco, Binghamton, N. Y. Offset Duplicator Review, Vol. 9, No. 1, January 1959, pages 28, 30, 32, 74, 4 pages. First installment of a series which reprints an Ansco booklet. General discussion includes copy, films, developers, cameras, papers, and inks.

*MASKING, THE SURE WAY TO GOOD COLOUR PRINTING. Anonymous. Reproduktion, No. 1, 1959, pages 11-21 (in German). Printing Abstracts, Vol. 14, No. 10, October 1959, page 814. The basic principles of colour correction by masking are discussed, four different types of masking being differentiated: projection, contact, integral and camera masks. The most suitable types of masks are tabulated for reflection originals, positive colour transparencies, and colour negatives. The following points are amongst those dealt with: principles of colour correction; use of the Kodak Colour Table; effect of masking; should the gray scale of all colour separation negatives correspond?; calculation of contrast and value; determination of the amount of masking necessary for a colour set and the density range; masking processes.

A REVIEW OF "ELECTROFAX" BEHAVIOR. J. A. Amick. RCA Review, Vol. 20, December 1959, pages 753-69; Ansco Abstracts, Vol. 20, No. 2, February 1960, page 67. An Electrofax sheet consists of a .5 mil layer of an about 50:50 mixture of crystalline photoconductive zinc oxide in a low-molecular weight silicone as flexible and hydrophobic insulating binder on a paper support. It forms a homogeneous semiconductor, in which a main function of the resin is the keeping away of moisture from the crystallite surfaces. In the negative corona charging (6000-v, dc) apparently negative oxygen ions are deposited in the surface, blocking contact to the conduction band of the layer and bringing the layer to a high-resistivity (dark-adapted) state. Two types of latent image can be formed, one consisting of light-produced electrons electrostatically attracted to trapped positive holes near the site of their formation (electron image), the other is due to decrease of the potential difference across the layer in the illuminated areas by the motion of electrons from the front towards the layer-support interface and possibly neutralization of the oxygen ions by the positive holes (electrostatic image). Either type of latent image can be developed, using a metal powder or metal ions, and tribo-electrically charged iron filings respectively. In the extension of the sensitivity of Electrofax layers by certain organic dyes apparently the dye molecule absorbs a photon of visible light and injects an electron into the conduction band of a zinc oxide crystallite.

*Electrolytic Photography. French Patent 1,173,444 3/30/56-2/25/59. E. G. Johnson and B. W. Neher to MMM. Ansco Abstracts, Vol. 19, No. 9, September 1959, pages 415-6, 2 pp. The process is based on the photoconductivity of zinc oxide. The latent image is developed electrolytically. The zinc oxide is applied with Pliolite resin as binder in a thickness of .0075-.015 mm to a support, which may be a cellulose acetate film, vacuum-coated with a very thin layer of aluminum. Development of the latent image requires a metal salt electrolyte such as copper sulfate, silver nitrate, or nickel chloride with sodium thiosulfate and application of an electric current of about 15 ma between the aluminum layer and an electrode

which may be a copper bar, plate, moving screen or roller. The electrolyte may be contained in a sponge, porous paper, a gelatin-glycerine layer or a Carbowax 6000 layer. If nickel acetate is mixed with the zinc oxide water only suffices as developer ingredient. The electrolyte may also contain diazonium salts, or diazotizable amines and sodium nitrite and couplers, which form a color picture on the zinc oxide. Other possibilities of image formation are the deposition of charged colloidal particles such as Prussian blue from a 1% dispersion, with the zinc oxide as anode, and the bleaching of dyes such as methylene blue or the azo dye Celliton Blue BGF Extra.

## PLANOGRAPHIC PRINTING PROCESSES

ALUMINUM PLATE QUALITIES. William Byers. The Graphic Arts Monthly 32, No. 3, March 1960, pp. 130,132,134,136 (4 pages). Physical, lithographic and other properties of zinc and aluminum are compared. Reference is made to Lithographic Technical Foundation Literature on the subject; also to the fact that LTF is doing research on zinc in an effort to recover for zinc some of the market lost to aluminum in recent years.

PROBLEMS OF ZINC PLATES ON THE PRESS. William Byers. Graphic Arts Monthly 32, No. 2, February 1960, pp. 110,112,114,116 (4 pages). Scumming of zinc plates on the press is thoroughly discussed from the pressman's standpoint. A test is given to determine whether the problem is in the plate or the press. Remedies are discussed in some detail.

TONE REPRODUCTION IN LITHOGRAPHY - THE EFFECT OF PLATEMAKING VARIABLES IN DEEP-ETCH PROCESS. L. E. Lawson and S. D. Winn. Journal of Photographic Science, Vol. 8, No. 1, January/February 1960, pp. 19-25 (7 pages). This report describes a series of experiments designed to determine the magnitude of the effects on the printing area of half-tones of some of the many variables encountered in deep-etch plate making. Graphs and tables are given showing the effect on printing area of exposure time, development time, etching time and changes in relative humidity and temperature.

*CONTRIBUTIONS TO THE PRINTING PROCESS ON SHEET-FED OFFSET PRINTING PRESSES. Kurt Wagenbauer. Archives Printing Paper, and Kindred Trades 96 (5), No. 3, 1959, pages 239-272, 34 pages (German-English abridgment). Bulletin of the Institute of Paper Chemistry, Vol. 30, Number 6, February 1960, page 817. The following factors influencing the offset printing process were studied quantitatively, using electromechanical (piezoelec., oscilloscopic, elongation strip-chart) and optical (interference-microscopic) methods; pressure and pressure distribution (impression force, pressure between rubber and impression cylinder, pressure between plate and rubber cylinder, and distribution of contact pressure); the behavior of offset inks during the printing process (ink rheology, ink-film splitting, interference colors, and tension forces during ink-film splitting); and sources and evaluation of experimental errors.

*LIGHT-SENSITIVE DIAZO PRINTING PLATE. Canadian Patent 579,337, filed December 15, 1952. Issued July 14, 1959. Oskar Sus, Wilhelm Neugebauer, and Maximilian P. Schmidt. Assigned to Azoplate Corp. Bulletin of the Institute of Paper Chemistry, Vol. 30, No. 6, February 1960, page 855. A diazo printing plate comprises a paper base coated with a sensitizing composition including as light-sensitive substance a sulfonic acid amide or anilide of o-quinone diazides.

PROOFING BY MEANS OF A POSITIVE PRESENSITIZED ALUMINUM PLATE. Charles Roeder. The Graphic Arts Monthly 30, No. 8, August 1958, pp. 80,82,84 (3 pages). Described in detail is a technique that uses a positive presensitized aluminum plate to get color proofs that closely match the final printed job.

## PAPER AND INK

PAPER - Eggshell, English Finish and Super Book. William H. Bureau. Graphic Arts Monthly 31, No. 12, December 1959, pp. 38,40,42 (3 pages). Various uncoated book papers are discussed particularly with regard to surface finish. These papers include Eggshell, bulking, English Finish, and Super-calendered or super book. Papermaking manipulations to achieve these various finishes are described briefly.

PAPER - SEMI-DULL ENAMELS. William H. Bureau. The Graphic Arts Monthly 32, No. 2, February 1960, pp. 172, 174, 176 (3 pages). Some uses for semi-dull enamels are given, including illustrations in double-tone inks. The manner of preparing the finish is described. A table gives comparisons between glossy and semi-dull enamels of various weights with regard to average thickness per sheet and average contrast ratio opacity.

HINTS ON USE OF MAGNETIC INKS. Maurice Adler. Graphic Arts Monthly 31, No. 12, December 1959, pp. 18, 20 (2 pages). The present use of magnetic ink characters for checks is only a first step toward future wider useage. Printing such inks by letterpress or lithography requires certain techniques, not difficult, which are covered in a few general suggestions.

AN EVALUATION OF ZIRCONIUM DRIERS. C. N. Finlay and P. M. Proudley. Paint Manufacture 29, No. 10, October 1959, pp. 318-322 (5 pages). Many metallic soaps have been examined from time to time for their activity in accelerating the drying of paints and inks. Few have been found satisfactory and therefore much interest attaches to the possibility of using compounds of zirconium. 5 Figures - 3 References.

PROGRESS IN METALLIC INKS. Henry Bloy. The British Ink Maker 2, No. 1, November 1959, pp. 23, 24, 42 (3 pages). Recent progress cited includes addition of tinting pigments to the varnishes used, more finely ground metallic pigment, and pigment in paste form ready for combining with the varnish at the press. These and other improvements are discussed in the specific cases of inks for the individual printing processes.

CALCULATING THE LENGTH AND COST OF ROLL PAPER. Anon. The Lithographer and Offset Printer 55, No. 9, September 1959, pp. 21-22 (2 pages). This article gives formulas for (1) Calculating how many feet of paper are in a roll -

$$L = \frac{65.45}{c}(D^2-d^2)$$

where

L = Length of paper in feet.
c = Paper caliper in mils (thousandths of an inch)
D = Overall diameter of roll in inches
d - Outside diameter of core in inches

(2) Calculating the gross weight of a roll of paper -

$$W = (D^2-d^2) \times \text{width of roll (in inches)} \times \text{Factor}$$

Gross wgt = W T wgt. of core.
Factor depends on the type of paper: Antique 0.018; Newsprint 0.019; Bond 0.021; Uncoated Offset 0.022; English Finish 0.027; Super 0.028; Coated One Side 0.030; Coated Two Sides 0.033. These factors give approximate answers. Factors can also be determined from experience:

$$\text{Factor} = \frac{\text{Gross weight of rolls - core wgt.}}{(D^2 d^2) \text{ X roll width in inches.}}$$

SOME THINGS TO KNOW ABOUT PAPER. W. Keith Gainer. Modern Lithography 28, No. 1, January 1960, pp. 43,44,45,46,119 (5 pages). A detailed, illustrated explanation of the relationships between air moisture content, air temperature and relative humidity; and the effects of these variables on paper. Six practical tips are given on paper handling in relation to humidity changes. 11 illustrations, mostly diagrams.

DIMENSIONAL STABILIZATION OF PAPER BY CROSSLINKING WITH FORMALDEHYDE. W. E. Cohen, A. J. Stamm, and D. J. Fahey. TAPPI 42, No. 12, December 1959, pp. 934-940 (7 pages). Dimensional stability is imparted to paper by crosslinking with formaldehyde in the vapor phase. The reaction is catalyzed by volatile acids and acidic salts. Studies of the effects of formaldehyde and catalyst concentration, and of reaction temperature and time on the dimensional stability and on the various dry and wet strength properties show that reasonably good dry strengths and greatly increased wet strengths are obtained up to reduction in swelling of 40%. Further reaction to attain higher degrees of dimensional stabilization, results in a considerable loss in some dry strength properties due to embrittlement of the paper. Only in cases where a significant loss in these dry strength properties is unimportant can the stabilization be safely carried to reductions in swelling of 60% or more.

GLASS FIBERS AND THE PAPER INDUSTRY. Leslie L. Warner. TAPPI 42, No. 12, December 1959, pp. 173a, 174a, 175a (3 pages). Glass fibers have been proved a useful addition to the conventional paper making fibers. They are available in a variety of types, lengths, and diameters, each of which imparts certain properties to paper. The use of glass in overcoming dimensional stability, porosity, drainage rate, drying rate, or burst resistance tear strength problem depends on the imagination of those who make paper. Data for specific advantages in properties are given as well as general information concerning problems encountered.

PRODUCTION OF PAPER AND BOARD BY THE DRY PROCESS. S. A. Pusyrew and M. Dimitriev. Pulp and Paper Magazine of Canada 61, No. 1, pp. T-3 - T-6 (4 pages). This translation of a paper presented in Leipzig in April 1957 describes the U.S.S.R. method of papermaking by depositing dry fibers on a moving screen. Drawings of the machines are given in some detail, and tables of the physical properties of the resulting papers and boards are included. Raw materials include 100% cotton, 100% synthetic fibers, 100% asbestos or glass fibers, mixtures of these, and rags and waste, giving products ranging from fine papers to unwoven textiles. Very long fibers (to 45mm.) can be oriented in one direction, or random orientation can be obtained giving papers with nearly identical properties in lengthwise and crosswise directions. It is claimed that the dry and wet strengths and elasticity of these products are significantly superior to conventionally made papers. Capital cost of plant is given as 1/6 and production costs 1/5 that of the conventional process since consumption of power, steam and water is low. Paper machine speeds are over 325 feet per min. Web widths are not given.

TITANIUM PIGMENTS AND THE EFFECT OF PARTICLE SIZE ON PRINTING INKS. Howard C. Spreen. American Ink Maker 38, No. 1, January 1960, pp. 32,33,35,36,37,38 (6 pages). A discussion of the use of titanium dioxide to effect whiteness and opacity in printing inks. Hiding power, refractive indices and other properties are presented in tables and graphs, in some cases in comparison with other white pigments. The basis for the most efficient use of the pigment is given for various circumstances. 8 references, 5 tables and 14 graphs or diagrams.

## LITHOGRAPHY - GENERAL

DEPARTMENT OF COMMERCE FIGURES SHOW LITHO STILL GAINING FASTEST. Anon. Modern Lithography 28, No. 1, January 1960, p. 50 (1 page). Figures released by the Department of Commerce based on census of manufacturers. A number of figures are cited, the most significant are contained in the following table:

HOW THREE PROCESSES HAVE GAINED

| Class of Products | Value of Shipments (thousands of dollars) '47 | '54 | '57 | Percent Change '47 '54 | '54 '57 |
|---|---|---|---|---|---|
| Lithographing | $485,081 | $999,112 | $1,319,597 | +106 | +32 |
| Letterpress, Gravure & Screen Process | 1,503,729 | 2,157,278 | 2,703,359 | + 44 | +25 |
| Greeting Cards | 107,716 | 184,988 | 234,402 | + 72 | +27 |

WHY LITHOGRAPHY? Walter J. Ash. Lithographers' Journal 44, No. 10, January 1960, pp. 11-12 (2 pages). A brief history of lithography in this country is followed by some reasons why lithography is growing in the packaging field. These have largely to do with the ease of producing illustrations and color in large sheet sizes.

THE INFLUENCE OF THE OFFSET BLANKET ON INK TRANSFER AND PRINT QUALITY. Anonymous. IGT Nieuws, Vol. 12, No. 5, May 1959, pages 68-72 (in Dutch); Printing Abstracts, Vol. 14, No. 10, October 1959, page 795. A report of the lecture given by Rhodes of the Rochester Institute of Technology in Munich on the influence of the rubber blanket on printing quality. There are mainly two factors which influence this, namely, the hardness and smoothness of the blanket.

PRESS STUDY SHOWS LITHO HOUR COSTS - COMPARING WEB AND SHEETFED PRESSES. Chris M. Foss. Printing Production 90, No. 3, December 1959, pp. 52, 53 (2 pages). An analysis is made on the basis of published hourly costs and time standards, plus plate costs and running rates. The product is a single color 32 page signature of approximately 8 ½ x 11 size. Presses compared are: 36 x 48 single color, 51 x 73 single color, and 2 unit 22 3/4 x 35 web press. Tables give rates, and comparison of costs of signatures for various quantities. A chart of costs against length of run shows that at start of run, smaller sheet fed press is below larger sheet fed, with web press highest. Break-even points as the run progresses are shown as follows: at 2.8 M the small sheet fed press cost rises above the larger sheet fed press. At 9.5 M the small sheet fed press cost rises above the web press cost and from there on is the highest in over all cost. At 15 M, the larger sheet fed press costs pass above the web fed press costs and the web press costs are lowest from there on. A swing toward webfed equipment could occur in the next ten years. 2 Tables - 1 Chart.

"DOING JOBS OTHERS CAN'T HANDLE". Anon. National Lithographer 67, No. 1, January 1960, pp. 39, 40, 60 (3 pages). Brief descriptions of methods used in the plant of the Register Division of the National Carbon Coated Paper Co. in turning out vast quantities of continuous forms, register forms and snap-out forms. Most of the work is done by web offset. Equipment and methods are discussed.

## GRAPHIC ARTS - GENERAL

COLOR ON COLOR . . . A MODERN PRINTING TREND! Faber Birren. Graphic Arts Monthly 32, No. 2, February 1960, pp. 38, 40, 42 (3 pages). Author advocates an approach to color harmony and color useage based on those already found in popular consumer goods rather than academic color concepts. Two series of colored papers for printing purposes are described: Impulse colors for attention setting; and Influence colors for more conservative uses.

ULTRASONIC METHOD OF PLATE CLEANING. Anon. Printing Magazine 84, No. 2, February 1960, pp. 94-95 (2 pages). An ultrasonic method of cleaning photo-engraved plates was installed in a New York printing plant. Prior cleaning methods required a 15-30 minute pre-soak in a solvent bath followed by a 5-10 min. hand brushing operation. Even then, all of the hardened ink was not removed. The current ultrasonic method employs a water solution of a detergent and the average engraving is perfectly cleaned in a 5 seconds immersion while the toughest cleaning problem is done in 3 minutes. A brief technical discussion of the ultrasonic theory of cleaning is included.

HALFTONE ETCHING DEPTHS (In Photomechanical Questions). J. S. Mertle. Graphic Arts Monthly 32, No. 2, February 1960, p. 36 (1 page). In answer to a question the author gives a table for highlights, middle-tones, and shadows for screens from 50 to 150 lines. The table is based on research conducted in Sweden.

USE OF COLORS IN FOODS, DRUGS, COSMETICS AND PACKAGING. Anon. American Ink Maker 38, No. 1, January 1960, pp. 27, 65 (2 pages). Discussion of limitations imposed on certain toxic pigments in various usages. Two standards on the subject are cited.

*TESTS FOR COLOR VISION. F. Jordinson and T. Minshall. Journal of the Society of Dyers and Colourists, Vol. 75, pages 585-93, December 1959; Ansco Abstracts, Vol. 20, No. 2, February 1960, page 61. The types of defective color vision and tests for their detection are discussed. The latter are divided into three types: the pseudoisochromatic charts, the Giles-Archer color projector, and matching tests. Of the matching tests the Wain Dichroicladder test was compared with the Ishihara charts in testing the color vision of 409 young people and found to possess the capacity of greater differentiation.

*COLOUR MATCHING AND ARRANGEMENT OF PICTURE IN PROOFING AND ON THE RUN. Anonymous. Roland Nachr. No. 12, May 1959, pages 18-22 (in German); Printing Abstracts, Vol. 14, No. 10, October 1959, page 818. If the printing is to be carried out satisfactorily from an economic and qualitative viewpoint, the original, proof and machine print must correspond. Preliminary work must be designed so as to eliminate all unnecessary loss of time during makeready, colour matching and during the run. The evaluation of the processes is facilitated by the use of step wedges. It is easier to determine differences in colour shades on a screened step wedge than on a solid area. The effects of the paper used and of the degree of dryness of the print on the colour are explained.

INK PLANT OBSERVER - ON MOIRE. I. M. Bernstein. American Ink Maker 37, No. 8, August 1959, pp. 32, 61 (2 pages). A brief general review on the appearance of moire patterns in halftone prints and some factors involved in producing these patterns.

GRAPHIC ARTS HAS FOUND GROUP APPROACH HELPS RESEARCH. Marvin C. Rogers, PhD. Printing Production 90, No. 3, December 1959, pp. 54,55,99,100,102 ( 5 pages). Research in the graphic arts is discussed in relation to the size of individual concerns in the industry in comparison with the larger research minded companies like duPont, 3M, Standard Oil or General Electric. Individual companies are in no position to conduct research themselves, hence group efforts, such as Lithographic Technical Foundation, Printing Plates Research, Gravure Research, Graphic Arts Research Foundation, American Newspaper Publishers Association, Book Manufacturers Institute and others. The success of LTF is cited. Other research activities at Rochester Institute of Technology, Lehigh University, Georgia Tech., University of Michigan and Battelle are mentioned. Supplier research in letterpress printing plates, gravure research, A.N.P.A. (Newspaper research), Graphic Arts Research Foundation (Photon Phototypesetting), National Printing Ink Research Institute, and the Institute of Paper Chemistry are mentioned as examples of success in group research. The responsibility of the supporting companies in converting research results into practical form is pointed out. Illustrations.